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# **Cervical Cancer Module I:**

## **Anatomy, Physiology and Pathology**

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### **Objectives**

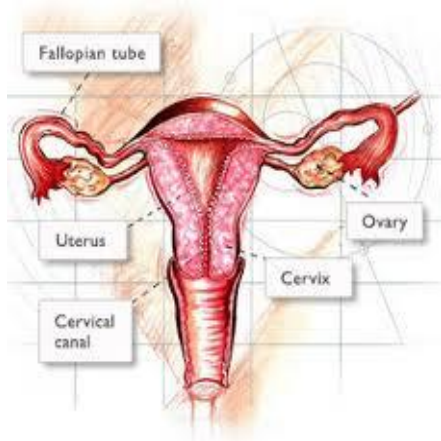
Understanding the anatomy of the cervix will allow a more comprehensive follow-up of precancerous and cancerous conditions.

After completion of this module, the clinician will be able to:

- Identify the normal anatomical structure of the cervix
- Be able to discuss the regions of the cervix: endocervix, ectocervix and squamocolumnar junction
- Interpret abnormal clinical and pathological findings
- Distinguish between the pre-cancerous and cancerous conditions
- Discuss the risk factors associated with pre-cancer or cancer conditions of the cervix
- Explain the early and advanced symptoms associated with cervical cancer

# Introduction

## Uterus



A hollow, pear-shaped organ called the uterus is located in the lower abdominal cavity of a woman. It is positioned between the bladder and the rectum. The cervix is the narrow inferior segment of the uterus which projects into the vaginal vault.

The cervix is a fibromuscular, cylindrical shaped organ and accounts for about one third of the uterus. It produces mucus that changes in consistency during the menstrual cycle to either prevent or promote pregnancy. The cervix is mainly associated with reproduction and performs an important function in the initiation/progression of labor.



The size of the cervix varies depending on age. In the adult female, most are angled downwards and backwards. It is barrel shaped in nulliparous females but changes shape in pregnancy and menopause. Generally it measures about 3-4 cm in length and 2.5 cm in diameter. It is divided into 2 sections: the endocervix and the ectocervix.

## Endocervix

The endocervix is the upper two thirds of the cervix and contains the internal os which opens into the uterus. The endocervix contains columnar glandular epithelium which produces mucus to help protect the entrance to the uterus. This is the area where adenosquamous carcinoma often begins here.

## Ectocervix

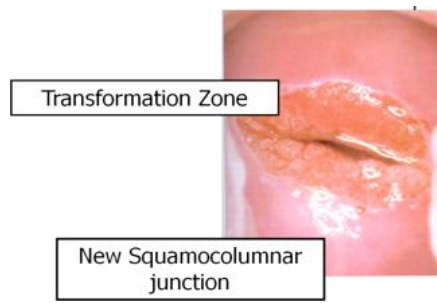
The ectocervix is the lower one third of the uterus and contains the external os which opens into the vaginal vault. The ectocervix is comprised of stratified squamous epithelium which covers the lip of the cervix. These cells protect the tissue beneath them<sup>1</sup>.

## **Squamocolumnar Junction**

The area between the ectocervix and the endocervix is known as the squamocolumnar junction or endocervical canal. It is lined with columnar epithelial cells and forms a canal that connects the external os and the internal os. Both the ectocervix and the vagina are lined with squamous epithelial cells. The location of the squamocolumnar junction changes throughout life: before puberty it is at the external os, in parous women it may be on the ectocervix while it can be found in the endocervical canal after menopause.

## **Transformation Zone**

This is the place at which columnar and epithelial cells meet thus forming the transformation zone which is the usual site of cervical carcinoma. This area incorporates the metaplastic change in the cervix and therefore extremely susceptible to carcinogens.



## **Risk Factors for Cervical Cancer**

Child birth before age 18

Cigarette smoking

Exposure to diethylstilbestrol (DES) during pregnancy

Infection with high-risk Human Papilloma Virus (HPV)

Multiple sex partners

Sexually active before age 18

Suppressed immune system by drugs or illnesses<sup>1</sup>

## **Symptoms of Cervical Cancer**

### **Early:**

Abnormal vaginal bleeding/spotting or watery discharge

Increasingly heavy menstrual bleeding

Post-coital bleeding

### **Advanced:**

Pelvic, back or leg pain

Post-coital bleeding

Post-Menopausal bleeding

Problems urinating

Leakage of urine or feces from the vagina

Swollen legs<sup>2</sup>

## **Cervical Cancer**

Cervical cancer forms in the cervix and can be detected by a Pap smear. The development of cervical cancer is usually very slow. It starts as a pre-cancerous condition called dysplasia. Dysplasia is also called “intraepithelial neoplasia”, an abnormal development of tissue. The degree of dysplasia is related to the number of normal cells replaced by atypical cells and the severity of the abnormality in the atypical cells. There are three levels of cervical intraepithelial neoplasia (CIN): CIN I, CIN II and CIN III.

### **Cervical Intraepithelial Neoplasia I (CIN I)**



Mild dysplasia affects about one third of the cervical epithelial thickness. This is a precancerous, low-grade, cervical intraepithelial neoplasia also known as a squamous intraepithelial lesion (SIL) and involves only cells on the surface of the cervix. Some low-grade lesions go away on their own while others may develop into a high-grade lesion over time<sup>1</sup>.

## **Cervical Intraepithelial Neoplasia II (CIN II)**



Moderate dysplasia affects about one third to two thirds of the cervical epithelial thickness.

## **Cervical Intraepithelial Neoplasia III (CIN III)**



Severe dysplasia and carcinoma in situ affects two thirds to full thickness of the cervical epithelium but does not involve the underlying stroma<sup>2</sup>.

## **Invasive Cervical Cancer**

The spread of abnormal cells deeper into the cervix is called invasive cervical cancer. It generally occurs most often in women over the age of 40. It is estimated that two-thirds of all cases of severe dysplasia (CIN III) will develop into invasive cancer if left untreated.

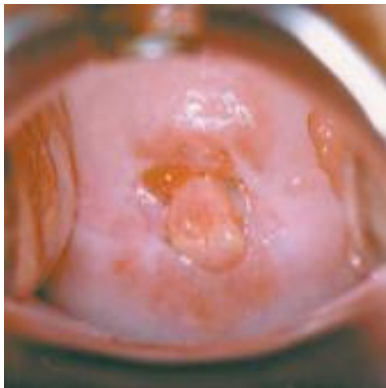
Once cervical cancer becomes invasive it can spread to the vagina, the parametrium, and eventually into the pelvic wall obstructing the ureters. It has also been known to spread to the bladder and rectum. If the cervical tumor cells invade the lymphatic system it then may spread into the pelvic, iliac and the aortic lymph nodes which are the most common sights<sup>2</sup>.

## **Metastasis**

Invasive cervical cancer may spread through the blood stream to the outer vagina, vulva, lungs, liver and brain. Invasion of the nerves is common in advanced cases. This may also spread throughout the abdomen when the tumor penetrates the full thickness of the cervix<sup>2</sup>.

## **Polyps**

Cervical polyps are benign fingerlike growths on the cervix. They are common in women over the age of 20 who have had children. The causes of cervical polyps are not understood. Polyps are *not cancerous*. Once removed, polyps usually do not grow back<sup>3</sup>.



## References

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